

# B-ISDN Onboard Processing Fast Packet Switch Developed



*Fast packet switch interface.*

Future satellite communications applications will require a packet-switched onboard satellite processing system to route packets at very high speeds from uplink beams to different downlink beams. The rapid emergence of point-to-multipoint services, and the important role of satellites in a national and global information infrastructure, makes the multicast function essential to a fast packet switch (FPS). NASA Lewis Research Center's Digital System Technology Branch has been studying possible architectures for high-speed onboard-processing satellite systems. As part of this research, COMSAT Laboratories developed a broadband integrated services digital network (B-ISDN) fast packet switch for Lewis that was delivered on December 1994.

The fast packet switch consists of eight inputs and eight outputs that can receive and transmit data, respectively, at a rate of 155 Mbps. The switch features multiple priorities (three) and multiple-size (three) satellite virtual cells that are similar to ATM cells in length (52 bytes). In addition, the fast packet switch features a congestion-control algorithm that allows users to set different thresholds for individual destination ports, thus throttling back the traffic from the transmitting port.

To allow for better characterization of the fast packet switch, the Artificial Intelligence Group of Lewis' Digital System Technology Branch developed a user-friendly graphical user interface to the switch. By using the graphical interface, users can efficiently compose commands and generate command script files. Users intuitively select commands from a graphical display by using a mouse. When a command is selected, appropriate parameter options are displayed for further selection. Command instructions and data responses, respectively, are transmitted to and from the fast packet switch via a direct RS-232 serial link. The fast packet switch responses to commands are automatically displayed and can be saved to a file for future reference. In addition, users can build a sequence of

commands into a script that can be saved, loaded, edited, and executed at a later time.

Errors in command syntax are avoided because only appropriate parameters are offered for the selected command name. Typing errors are avoided because users enter data with the mouse. This intelligent user interface also allows less-experienced users to quickly generate complicated scripts. Users do not have to remember all possible command codes, command options, and corresponding formats. Later, the interface will be integrated with the artificial-intelligence shell Kappa-PC. This shell could help users decide which command or group of commands are needed to perform certain tasks. Also Kappa-PC can help users select appropriate command options.